



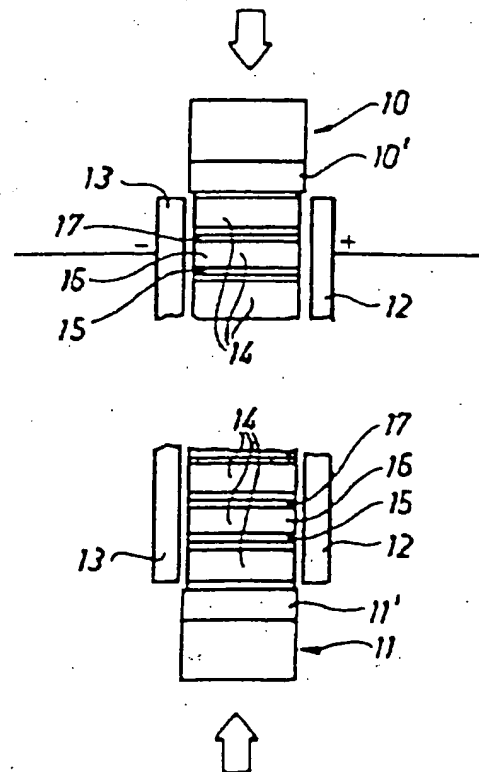
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : B27M 3/04	A1	(11) International Publication Number: WO 96/30177 (43) International Publication Date: 3 October 1996 (03.10.96)
(21) International Application Number: PCT/SE96/00377 (22) International Filing Date: 26 March 1996 (26.03.96) (30) Priority Data: 9501089-8 28 March 1995 (28.03.95) SE (71) Applicant (for all designated States except US): TARKETT AB [SE/SE]; S-289 89 Hanaskog (SE). (72) Inventor; and (75) Inventor/Applicant (for US only): LINDER, Johnny [SE/SE]; Krabbavägen 31, S-289 50 Hanaskog (SE). (74) Agent: AWAPATENT AB; P.O. Box 5117, S-200 71 Malmö (SE).	(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published With international search report. In English translation (filed in Swedish).	

(54) Title: METHOD OF PRODUCING A BUILDING ELEMENT DESTINED FOR THE MAKING OF A LAMINATED WOODEN FLOOR

(57) Abstract

In a method of producing a building element, which consists of glued-together layers of wood (15-17) and which is destined for the making of a laminated wooden floor, such as a parquet floor, at least two layers of wood (15-17) are placed one above the other with an intermediate layer of glue so as to form a base unit (14). The base unit (14) is compressed between two press plates (10, 11) extending in parallel with the layers of wood (15-17). During compression, an electromagnetic high-frequency alternating field is applied across the base unit (14) in order to harden the glue in the layer of glue. The electromagnetic high-frequency alternating field is applied across two electrode plates (12, 13) which extend perpendicular to the press plates (10, 11) and which, during the compression of the base unit (14), are placed on both sides of the base unit in the vicinity of two opposite side edges thereof.



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METHOD OF PRODUCING A BUILDING ELEMENT DESTINED FOR
THE MAKING OF A LAMINATED WOODEN FLOOR

The present invention relates to a method of producing a building element, which consists of glued-together layers of wood and which is destined for the making of a laminated wooden floor, such as a parquet floor, in which method at least two layers of wood are placed one above the other with an intermediate layer of glue so as to form a base unit, which is compressed between two press plates extending in parallel with the layers of wood, an electromagnetic high-frequency alternating field being applied across the base unit in order to harden the glue in the layer of glue.

A known method of this kind will now be described in more detail with reference to Fig. 1, which schematically illustrates the known method.

A base unit in the form of a rectangular board 1, which is of a width of about 1 m and a length of about 2 m, is made up of five layers of wood 2-6 with intermediate layers of heat-hardenable glue. The board 1 consists of a lower, about 2-mm-thick bottom veneer layer 2, an about 10-mm-thick intermediate veneer layer 3 arranged thereon, an about 10-mm-thick intermediate layer 4 arranged on the layer 3 and consisting of a plurality of wood bars laid in a predetermined pattern, an about 10-mm-thick intermediate veneer layer 5 placed on the intermediate layer 4 and being of the same kind as the intermediate veneer layer 3, and an upper, about 2-mm-thick bottom veneer layer 6, which is of the same kind as the bottom veneer layer 2.

The board 1 is placed in a press between an upper press plate 7 and a lower press plate 8, between which it is compressed. During compression, an electromagnetic high-frequency (10-30 MHz) alternating field is applied across the board 1 to harden the glue in the glue layers.

This high-frequency alternating field is applied by means of an oscillator system 9, which is connected to the two press plates 7 and 8 as shown in Fig. 1.

After hardening of the glue (after about 1 min), the board 1 is removed from the press to be divided into two boards by sawing in the centre of the intermediate layer 4. The divided layer 4 of each board should form an upper wearing coat of the wooden floor that is to be produced of the boards.

When the board 1 is removed from the press, it has a temperature of up to 100°C. However, the board 1 has an uneven temperature distribution and is warmest in its intermediate portion. The uneven temperature distribution results in an uneven moisture distribution in the board 1, which in turn causes unfavourable stress conditions in the board. Before the board 1 is divided and then used as building element, it must therefore be reconditioned under predetermined climatic conditions. Such reconditioning lasts 2-5 days.

The object of the present invention is to provide a method of producing a building element, the method being of the type described by way of introduction and permitting a reduction of the working time in the press and not requiring any subsequent reconditioning step.

The object is achieved by a method which is of the type described by way of introduction and characterised in that the electromagnetic high-frequency alternating field is applied across two electrode plates which are substantially perpendicular to the press plates and which, during the compression of the base unit, are placed on both sides of the base unit in the vicinity of two opposite side edges thereof.

The invention will now be described in more detail with reference to the accompanying drawing.

Fig. 1 illustrates schematically the above described known method.

Fig. 2 illustrates schematically the inventive method.

Fig. 2 shows a press, which comprises a horizontal upper press plate 10 and a horizontal lower press plate 11. The press also comprises two vertical plates 12 and 13 which are parallel with each other.

A plurality of board-shaped base units 14 being of a length of about 2 m and a width of about 20 cm, are made up of three layers of wood 15-17 with intermediate layers of heat-hardenable glue. Each base unit 14 consists of an about 2-mm-thick bottom veneer layer 15, an about 6-mm-thick intermediate veneer layer 16 arranged thereon, and an about 2-mm-thick upper layer 17 arranged on the intermediate veneer layer 16 and consisting of a plurality of wood bars laid in a predetermined pattern. The upper layer 17 should form an upper wearing coat of the wooden floor that is to be produced of building elements made of the base units 14.

A stack of 20-30 superposed base units 14 are placed in the press between the two press plates 10 and 11 and vertical plates 12 and 13 thereof to be compressed vertically. The stack is arranged in the press, such that the long sides of the board-shaped base units 14 included therein extend in parallel with the vertical plates 12 and 13. The vertical plates 12 and 13 are laterally displaceable to be able to be moved towards the stack and orient the base units 14 included therein in relation to each other and in relation to the press plates 10 and 11. During compression, the vertical plates 12 and 13 are held slightly spaced from the stack.

The vertical plates 12 and 13 constitute electrode plates and are connected to an oscillator system (not shown) in order to apply, during compression, an electromagnetic high-frequency (10-30 MHz) alternating field across the stack and, thus, cause hardening of the glue in the glue layers between the layers of wood 15-17 in each base unit 14.

The upper press plate 10 and the lower press plate 11 each consist of a metal plate, which on its underside and its upper side, respectively, supports a plastic plate 10', 11' preventing flashover between the vertical plates 12, 13 on the one hand and the respective press plates on the other hand.

By applying the electromagnetic high-frequency alternating field by means of the two vertical plates 12 and 13, it reaches all glue layers directly without first passing through one or more layers of wood. For this reason, the glue is hardened in a very short time (10-30 sec) and heated between the layers of wood 15-17 but to a small extent, which makes it unnecessary to perform any subsequent reconditioning of the building elements produced in the press.

CLAIMS

1. A method of producing a building element, which
5 consists of glued-together layers of wood (15-17) and
which is destined for the making of a laminated wooden
floor, such as a parquet floor, in which method at least
two layers of wood (15-17) are placed one above the other
with an intermediate layer of glue so as to form a base
10 unit (14), which is compressed between two press plates
(10, 11) extending in parallel with the layers of wood,
an electromagnetic high-frequency alternating field being
applied across the base unit (14) in order to harden the
glue in the layer of glue, c h a r a c t e r i s e d i n
15 that the electromagnetic high-frequency alternating field
is applied across two electrode plates (12, 13) which are
substantially perpendicular to the press plates (10, 11)
and which, during the compression of the base unit (14),
are placed on both sides of the base unit in the vicinity
20 of two opposite side edges thereof.

2. The method as claimed in claim 1, c h a r a c -
t e r i s e d i n that, before the compression of the base
unit (14), the electrode plates (12, 13) are used to
orient the layers of wood (15-17) relative to each other.

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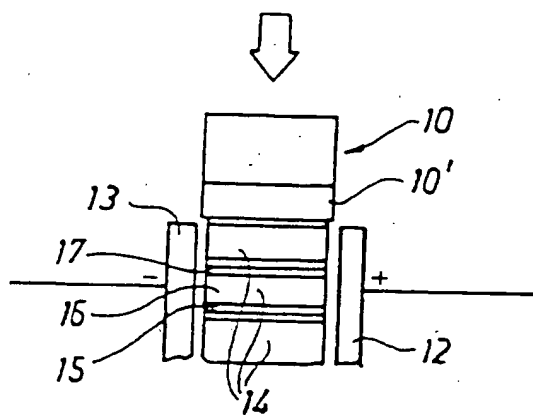
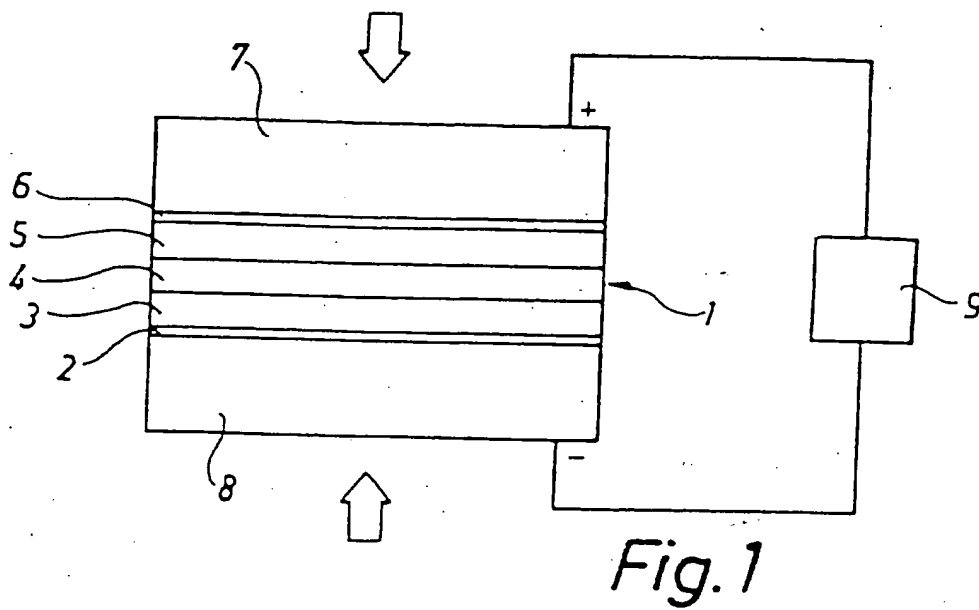
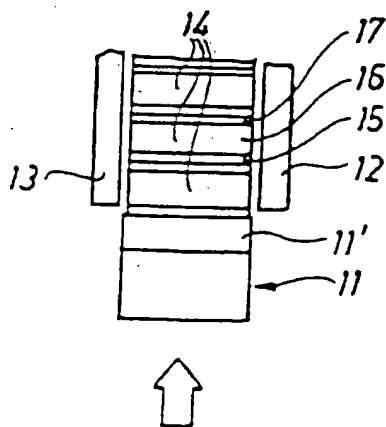


Fig. 2



INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 96/00377

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: B27M 3/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: B27M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

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QUESTEL: WPIL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2077902 A (DUBOST GERARD ET AL), 5 November 1971 (05.11.71) --	1-2
A	Derwent's abstract, No E6220 E/16, week 8216, ABSTRACT OF SU, 844316 (ORGTEKHSTROI TRUST), 7 July 1981 (07.07.81) --	1-2
A	US 5109898 A (SCHACHT), 5 May 1992 (05.05.92) --	1-2
A	DE 3036793 C1 (CASIMIR KAST GMBH & CO KG), 16 June 1982 (16.06.82) -- -----	1-2

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Date of the actual completion of the international search

4 July 1996

Date of mailing of the international search report

11-07-1996

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

01/04/96

PCT/SE 96/00377

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
FR-A-	2077902	05/11/71	NONE		
US-A-	5109898	05/05/92	DE-A-	3908851	20/09/90
			EP-A, A, A	0387902	19/09/90
DE-C1-	3036793	16/06/82	AT-E, T-	6351	15/03/84
			CA-A-	1169637	26/06/84
			EP-A, A, B	0048812	07/04/82
			SE-T3-	0048812	
			US-A-	4366020	28/12/82